# Patient Factors and Their Association with Nonmelanoma Skin Cancer Morbidity and the Performance of Self-skin Exams

## A Cross-Sectional Study

[a,b]KYLE T. AMBER, MD; [b]ROMI BLOOM, MD; [b]MOHAMMAD-ALI YAZDANI ABYANEH, MD; [b]LEYRE A. FALTO-AIZPURUA, MD; [b]MARTHA VIERA, MD; [c]MARTIN N. ZAIAC, MD; [b]KEYVAN NOURI, MD; [b]SHASA HU, MD

[a]Department of Dermatology, University of California Irvine Medical Center, Irvine, California; [b]Department of Dermatology & Cutaneous Surgery, University of Miami, Miller School of Medicine, Miami, Florida; [c]Department of Dermatology, Herbert Wertheim College of Medicine, Florida International University, Miami, Florida

## ABSTRACT

**Objective:** Mohs micrographic surgery is widely utilized for the treatment of nonmelanoma skin cancers with the advantage of tissue sparing and higher cure rate. The preoperative tumor size and post-Mohs micrographic surgery defect size are useful surrogate measures of nonmelanoma skin cancer morbidity. The authors sought to evaluate whether gender, Hispanic ethnicity, socioeconomic status, sun-safe practices and self-skin exams affected tumor size and Mohs micrographic surgery defect size. They also investigated factors associated with self-skin exams. **Design:** A cross-sectional survey-based study. **Setting:** Two dermatologic surgery clinics—one academic-associated and the other private. **Participants:** Patients receiving Mohs surgery for nonmelanoma skin cancers. **Measurements:** Tumor size and Mohs defect size and their relationship to patient factors ascertained from a survey, as well as the number of patients performing self-skin exams. The authors used $t$-tests and analysis of variance to compare tumor and defect sizes for each patient factor. Chi-squared tests were used to determine the factors associated with self-skin exams performance. **Results:** Lower education was associated with greater head and face tumor area ($95mm^2$ vs. $41mm^2$, $P$=0.019), but not Mohs micrographic surgery defect size. Other studied patient factors were not associated with an increased morbidity. Hispanics performed self-skin exams at a lower rate than non-Hispanics (27% vs. 46%, $p$=0.03). **Conclusion:** This study innovatively uses tumor and Mohs micrographic surgery defect area as a measure of morbidity, allowing for identification of populations at need for improved education and prevention. (*J Clin Aesthet Dermatol.* 2016;9(9):16–22.)

Mohs micrographic surgery (MMS) is used for the treatment of nonmelanoma skin cancer (NMSC) with the advantage of increased tissue preservation.[1] The utilization of MMS has increased over the years from three percent in 1995 to 17 percent in 2010.[2] Furthermore, MMS has the best long-term cure rate of any basal cell carcinoma (BCC) treatment.[1] MMS is indicated for the removal of all BCCs on the central face, eyelids, eyebrows, nose, lips, and chin (area H).[3] With the exception of primary superficial BCCs less than or equal to 0.5cm in healthy individuals, MMS is also appropriate for all BCCs of the cheeks, forehead, scalp, neck, jawline, and pretibial surface (area M).[3] MMS is also appropriate for primary aggressive and recurrent aggressive squamous cell carcinoma (SCC) in all areas.[3] In areas H and M for any size tumor and for all lesions greater than 2cm, MMS is suitable for primary SCC without aggressive histologic features.[3] The defect size after MMS has been used as a precise measure of morbidity and can be influenced by delay in treatment, initial examination by a primary provider, misdiagnosis, failure to obtain a biopsy before treatment, or multiple surgical removals.[4]

**DISCLOSURE:** The authors report no relevant conflicts of interest. Part of this study was funded by the Department of Dermatology and Cutaneous Surgery, University of Miami Miller School of Medicine, Miami, Forida.

**ADDRESS CORRESPONDENCE TO:** Shasa Hu, MD, Associate Professor, Department of Dermatology and Cutaneous Surgery, University of Miami Miller School of Medicine, 1600 NW 10th Ave, RMSB 2023A, Locator Code R-250, Miami, FL 33136; E-mail: shu@med.miami.edu

Skin cancer morbidity has been evaluated in various populations. Studies of the African American and Hispanic populations demonstrate that skin cancer presents at a later stage than compared with Caucasian patients, potentially due to lower awareness, more advanced stages at diagnosis, and barriers to healthcare access and utilization.[5,6] Patients with darker skin types (Fitzpatrick IV to VI) have a diminished ability to identify NMSC.[7] Furthermore, Hispanics perform skin cancer surveillance less frequently than Caucasians.[8] For instance, only 17.6 percent of Hispanics have ever conducted a self-skin exam and only 9.2 percent have had a total cutaneous examination by a healthcare professional.[8]

Presentation of NMSC can differ in people with darker skin compared to lighter skin individuals. In darker skinned patients, BCC can present with pigmentation in the majority of cases, and dark papules can also present as nodules, plaques, and ulcers.[5] Interestingly, in non-Hispanic individuals aged 60 to 85, NMSC appears to be more common on the left side (53.1% of cases), while it is more common on the right side (54.0% of cases) in Hispanic individuals of the same age group.[9]

The impact of socioeconomic status (SES) on NMSC morbidity is mixed. In Denmark, high SES, defined by education level and disposable income, was strongly associated with an increased risk for BCC.[10] However, for SCC there was no association with educational level and only a slight association with income.[10] BCC and SCC survival was not affected by socioeconomic indicators.[10] Recently, skin cancers on the trunk and limbs in younger people from urban areas has been increasing, perhaps due to affluence and resultant leisure-related, sporadic sun exposure.[11] In Scotland, the most economically privileged quintile had the highest skin cancer incidence.[12] Overall, identification of NMSC among all racial groups is poor and demonstrates the need for improved public education.[13]

The authors sought to evaluate whether patient factors including sex, Hispanic ethinicity, SES, sun-safe practices, and self-skin exams were associated with greater NMSC morbidity using the MMS defect area to compare patient demographics. Given the authors' large local Hispanic population in South Miami, they additionally sought to confirm previous findings regarding self-skin exam in the Hispanic versus non-Hispanics.

## METHODS

**Study device.** A written survey was administered to ascertain background information on patients. The study was approved by the University of Miami's institutional review board. Patients were enrolled from December 2013 to February 2015 at the following two sites: an academic dermatologic surgery clinic and a non-university affiliated private clinic. Patients received informed consent and were enrolled by research personnel while waiting before their Mohs surgery or during their wait after the initial MMS stage was taken. Following surgery, tumor and surgical site information was extracted from patient charts. Each tumor was recorded as a separate outcome variable. Completed surveys were entered in the Microsoft Excel software with all statistical tests performed using the IBM SPSS 20 software. Statistical significance for all tests was defined as $P<0.05$ using two-tailed testing.

**Tumor area and Mohs defect area.** Tumor size and MMS defect size were calculated by measuring the greatest distance of the long axis as well as the length of the perpendicular axis. These values were multiplied to create the tumor area and MMS defect area. Tumors were divided into two groups, head/face tumors and trunk/extremity tumors, to minimize the effect and potential bias of body location on morbidity. Head and face tumor areas were considered the primary endpoint as the tumors were thought to more likely meet criteria for MMS, as well as have less inherent variability in size than trunk/extremity tumors.

For statistical tests, the square root of tumor and defect areas was taken to relinearize the data. Total tumor areas were correlated with defect areas using a Pearson correlation to determine a baseline relationship between these two values. Histogram plots were generated to determine the distribution of these data (Figure 1). As there was a sizeable deviation in the distribution of these corrected tumor and defect sizes, a natural log transformation was performed. This allowed for the independent samples' *t*-test to be used to compare means among the different analyses.

**Assessing factors associated with greater tumor burden.** Independent sample *T*-tests were performed to compare tumor size and MMS defect size among the different grouping variables versus their respective null conditions (i.e., Hispanic versus non-Hispanic, etc.). *T*-test significance was determined using the assumptions of equal variance determined by calculating the F statistic of the Levene Test of Equality of Variance. In the case that $P<0.05$ for the F statistic (data not shown), variance was assumed to be unequal. To compare transformed tumor and defect sizes among multiple education and Fitzpatrick skin types, a one way analysis of variance (ANOVA) was used. Age and Fitzpatrick total scores (not skin type), were correlated with uncorrected tumor area and defect areas using a Pearson correlation.

**Factors associated with performing self-skin exam.** To determine the relationship between patient factors and the performance of SSE, the authors generated 2x2 contingency and performed $\chi^2$ tests tables using binary variables (i.e., patients with a history of skin cancer versus those without). Data was based on each patient rather than each tumor, except for right or left sidedness.

## RESULTS

**Survey results.** The authors recruited a total of 150 patients accounting for 187 tumors. There were 139 head and face tumors and 48 truncal/extremity tumors. Males accounted for 74.8 and 67.4 percent of individuals sampled for each of these body groupings, respectively. Hispanics accounted for 28.3 and 14.6 percent, respectively. Tumor area strongly correlated with MMS defect ($R=0.88$, $P<0.001$)

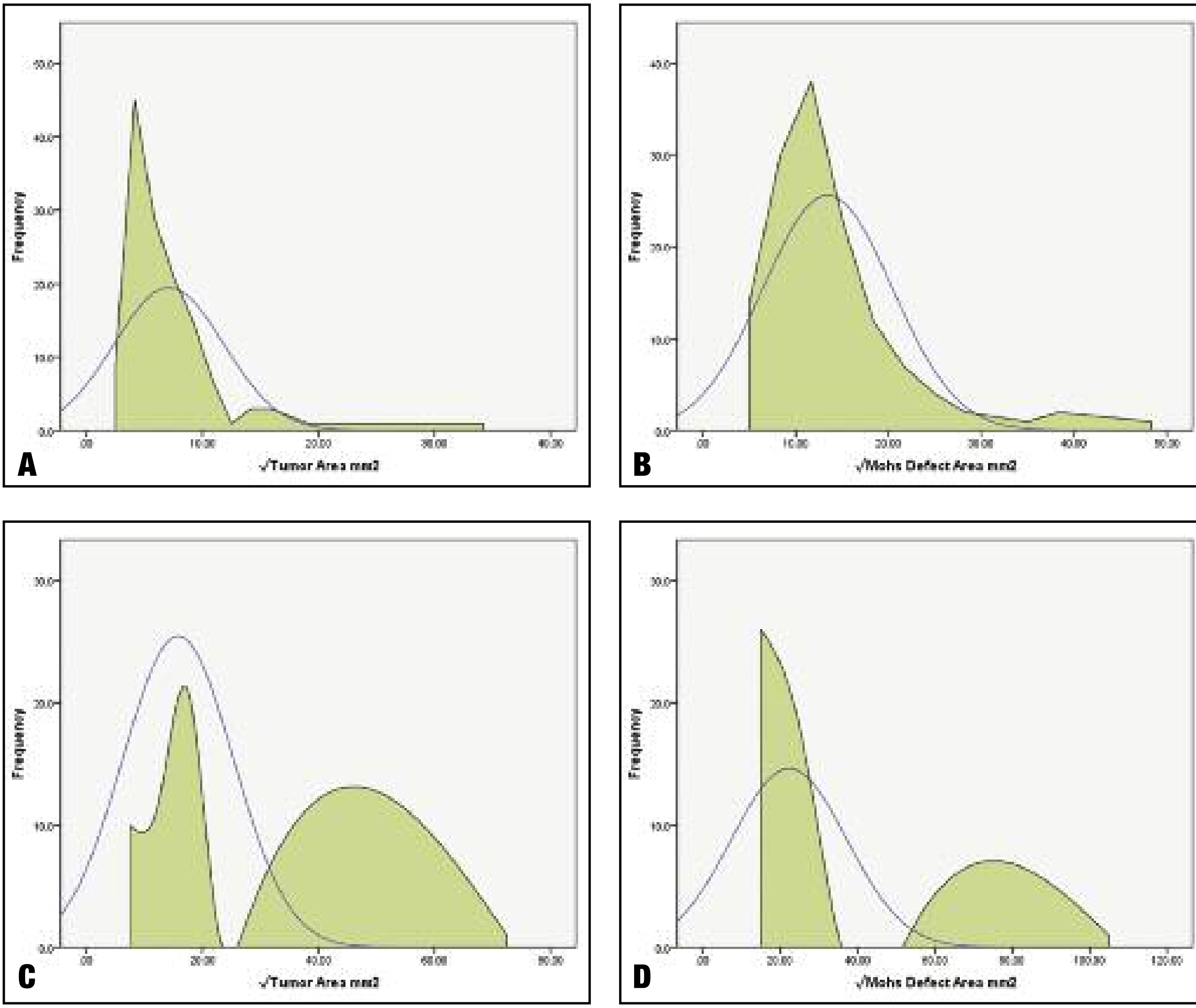


**Figure 1.** Distribution of the square root of tumor areas and Mohs defect area in head/face tumors (A) and (B), and trunk/extremity tumors (C) and (D), respectively. Head and face

**Factors associated with greater tumor burden.** Patient factors were overall not significantly associated with MMS defect size in both head/face and trunk/extremity tumors, though there was a trend toward worse morbidity in individuals with low levels of education. Low education was, however, associated with a significantly larger tumor size. Given the significant ANOVA indicating a difference in tumor and MMS defect areas in patients with different education levels, the authors performed a *post-hoc* analysis of those with high school education or less and those with advanced degrees (masters or higher). Head and face tumor area was greater in those with high school education or lower versus those with advanced degrees (95mm$^2$ vs. 41mm$^2$, $P$=0.019). MMS defect was likewise significantly greater (275mm$^2$ vs. 173mm$^2$, $P$=0.041). Accounting for *post-hoc* testing using a Bonferroni correction, those with less education still had a significantly greater tumor area than those with advanced education. SCCs on the head and face had significantly larger tumor areas than BCCs, but the difference in MMS defect did not reach significance. Interestingly, the performance of SSE was not significantly associated with a reduction in morbidity as measured by either tumor area or MMS defect. Data for head/face tumors and trunk/extremity tumors are presented in Tables 1 and 2, respectively. Pearson correlations between age and Fitzpatrick total scores with uncorrected tumor area and defect areas did not reveal any significant trends (Table 3).

**Factors associated with performing self-skin exam.** Hispanics performed SSE at a significantly lower rate than non-Hispanics (27% vs. 46%, $P$=0.03). English acculturation among Hispanics (i.e., reading, speaking, and thinking in English) was associated with higher rates of SSE. Those who were previously taught skin cancer preventative strategies including how to perform an SSE as well as the ABCDs of melanoma were more likely to perform SSE. Likewise, seeing a physician in the last five years and having a previous SCC were associated with an increase in SSE. Oddly, those with right- sided tumors were far more likely to perform SSE than those with left. Factors associated with performing self-skin exams are summarized in Table 4.

## DISCUSSION

In the authors' study, they evaluated the association between demographic factors and NMSC morbidity using tumor area and MMS defect as an outcome measure. They did not identify any factors associated with increased morbidity using MMS defect size as a measure. Using tumor area as a measure of morbidity, they identified an association between less education and larger tumors. Robinson et al[14] examined those with giant (>10cm diameter) BCCs and SCCs, noting a significantly lowered SES in the giant tumor group. Studies of socioeconomic factors and skin cancer have, however, primarily focused on incidence rather than morbidity. Higher socioeconomic status has been associated with a higher incidence of BCC,[15] yet had no association with SCC risk.[10] Interestingly, low education is associated with a perception of lower risk of developing skin cancer.[16] Yet, in a large population study in Denmark, SES was not associated with increased mortality secondary to NSMC.[17]

The authors additionally confirmed previous findings demonstrating a decreased rate of self-skin exams in Hispanics.[8,18–21] They, however, noted English acculturation to be associated with a higher rate of SSE which while in agreement with a study by Coups et al[8] contrasts with some previous reports noting worse protective behaviors in this group.[22,23] Patients

**TABLE 1. Comparison of patient factors with tumor and Mohs defect areas for head and face tumors**

| HEAD AND FACE n = 139 | | | | | |
|---|---|---|---|---|---|
| | | Tumor Area mm² | *P* | Mohs Defect mm² | *P* |
| **SC type** | 48.4% BCC<br>51.6% SCC | 66 / 85 | **<0.01** | 225 / 244 | .12 |
| **Age** | 67.6±11.7 | 72 | - | 228 | - |
| **Gender** | 74.8% male | 85 / 38 | 0.08 | 248 / 185 | 0.66 |
| **Hispanic** | 28.3% | 78 / 70 | 0.99 | 232 / 223 | 0.93 |
| **Birth place** | 61.7% USA | 61 / 74 | 0.84 | 221/ 210 | 0.46 |
| **Insurance coverage*** | 16.2% need based<br>83.8 % non-need | 104 / 75 | 0.37 | 267 / 236 | 0.42 |
| **Cancer Hx** | 26.1% yes | 5 / 80 | 0.75 | 206 / 242 | 0.53 |
| **Education** | 47.8%≤secondary<br>35.5% bachelors<br>16.5% advanced | 95<br>56<br>41 | **0.03** | 275<br>197<br>173 | 0.08 |
| **Blistering sunburns** | 60.9%≤5 | 68 / 84 | 0.88 | 210 / 263 | 0.39 |
| **Skin exam in 1 year** | 68.3% yes | 61 / 96 | 0.14 | 202 / 290 | 0.16 |
| **Skin exam in 5 years** | 74.8% yes | 58 / 115 | 0.05 | 201 / 320 | 0.19 |
| **Time before seeing a doctor** | 65.9%≤4 weeks | 71 / 83 | 0.24 | 226 / 241 | 0.13 |
| **Number of doctors seen for SC** | 55.4%≥2 doctors | 66 / 77 | 0.46 | 188 / 259 | 0.72 |
| **Saw PCP first** | 39% yes | 102 / 55 | 0.09 | 269 / 206 | 0.52 |
| **Felt appointment was soon enough** | 23.6% yes | 136 / 56 | 0.06 | 360 / 184 | 0.07 |
| **Learned SSE** | 31.9% yes | 72 / 74 | 0.22 | 242 / 226 | 0.21 |
| **Performed SSE 1yr** | 43.7% yes | 75 / 72 | 0.96 | 240 / 224 | 0.98 |
| **Relative with SC** | 48.4% yes | 76 / 67 | 0.58 | 253 / 205 | 0.93 |
| **Self Hx of SC** | 60% yes | 63 / 87 | 0.30 | 223 / 226 | 0.25 |
| **Sunscreen Fx** | 77.9%<daily | 80 / 39 | 0.25 | 244 / 167 | 0.43 |
| **SPF used** | 62.1%≤30 | 56 / 47 | 0.29 | 197 / 205 | 0.84 |
| **Knows ABCDs** | 19.1% yes | 54 / 78 | 0.38 | 105 / 254 | 0.08 |
| **Side of body** | 54.6% left | 74 / 74 | 0.63 | 217 / 232 | 0.41 |
| **Fitzpatrick type** | 16.5% type I<br>83.5% type II | 56 / 157 | 0.07 | 266 / 322 | 0.83 |

Fx=Frequency, Hx=History, PCP=Primary care physician, SC=Skin Cancer, SPF=Sun protection factor, SSE=Self-skin exam. *3 uninsured patients excluded from analysis. *P* values indicate the difference between natural log transformed square root areas LN (√Area)

**TABLE 2. Comparison of patient factors with tumor and Mohs defect areas for trunk and extremity tumors**

| | | Tumor Area $mm^2$ | *P* | Mohs Defect | *P* |
|---|---|---|---|---|---|
| **TRUNK AND EXTREMITY n = 48** | | | | | |
| **SC type** | 57.9% BCC<br>42.1% SCC | 255 / 499 | 0.83 | 491 / 1121 | 0.96 |
| **Age** | 64.9 +/- 14.4 | 711 | - | 338 | - |
| **Gender** | 67.4% male | 402 / 227 | 0.14 | 851/ 470 | 0.14 |
| **Hispanic** | 14.6% | 145 / 371 | 0.07 | 268 / 787 | 0.07 |
| **Birth place** | 53.3% USA | 235 / 447 | 0.67 | 399 / 1008 | 0.48 |
| **Insurance coverage** | 4.4% need based<br>95.6 % non-need | 179 / 353 | 0.52 | 320 / 753 | 0.56 |
| **Cancer Hx** | 14.6% yes | 199 / 361 | 0.14 | 656 / 720 | 0.78 |
| **Education** | 41.7%≤secondary<br>45.8% bachelors<br>12.5% advanced | 246<br>451<br>230 | 0.45 | 502<br>989<br>390 | 0.40 |
| **Blistering sunburns** | 74.5%≤5 | 381 / 215 | 0.11 | 792 / 499 | 0.32 |
| **Skin exam 1 year** | 52.1% yes | 428 / 240 | 0.96 | 920 / 484 | 0.64 |
| **Skin exam 5 years** | 50.0% yes | 461 / 214 | 0.15 | 977 / 445 | 0.15 |
| **Time before seeing a doctor** | 53.5%≤4 weeks | 422 / 263 | 0.63 | 836 / 636 | 0.62 |
| **Number of doctors seen for SC** | 48.9%≥2 doctors | 225 / 459 | 0.86 | 406 / 1043 | 0.71 |
| **PCP first** | 27.1% yes | 605 / 238 | 0.50 | 1405 / 453 | 0.29 |
| **Appointment soon enough** | 21.3% yes | 733 / 235 | 0.80 | 1685 / 458 | 0.51 |
| **Learned SSE** | 20.8% yes | 212 / 371 | 0.28 | 564 / 750 | 0.76 |
| **Performed SSE 1 year** | 33.3% yes | 225 / 394 | 0.55 | 503 / 815 | 0.60 |
| **Relative with SC** | 27.9% yes | 217 / 383 | 0.41 | 485 / 777 | 0.31 |
| **Self Hx of SC** | 53.3% yes | 448 / 222 | 0.42 | 946 / 490 | 0.52 |
| **Sunscreen Fx** | 72.9% daily | 296 / 60 | 0.13 | 600 / 239 | 0.09 |
| **SPF** | 58.1% ≤30 | 204 / 214 | 0.99 | 371 / 95 | 0.95 |
| **Knows ABCDs** | 14.6% yes | 856 / 248 | 0.90 | 1913 / 506 | 0.74 |
| **Side of body** | 42.1% left | 570 / 991 | 0.44 | 267 / 462 | 0.83 |

**Fx=Frequency, Hx=History, PCP=Primary care physician, SC=Skin Cancer, SPF=Sun protection factor, SSE=Self skin exam. *P* values indicate the difference between natural log transformed square root areas LN(√Area)**

who received formal instruction in skin-cancer preventative practices (identifying ABCDs of melanoma, how to perform SSE) were more likely to perform SSE. This is in line with the finding that a doctor's recommendation significantly increased patient preventive behaviors.[24]

While the performance of SSE did not appear to affect NMSC morbidity using tumor or area of MMS defect area as a marker of morbidity, SSE may potentially lead to earlier presentation of melanoma.[25] While Alam et al[26] demonstrated that patients with previous skin cancers were more likely to delay care for NMSC with a subsequent larger tumor size, the authors of the paper herein found this group to perform SSE significantly more frequently.

The authors' study is limited by the use of head and face tumor/defect size as a primary outcome rather than a more specific anatomical area. Specific subanatomical locations and tumor subtypes may lead to a more precise outcome measure. For example, MMS defects have been noted to be significantly larger on nonvisible areas of the ear compared to visible areas.[27] Similarly, tumors of the lateral canthus leave significantly larger defects than the medial eyelid.[28] BCC of the ear additionally exhibit greater subclinical extension than non-ear BCC.[29] Certain subtypes vary in average defect size. For example, morpheaform BCC are often more aggressive than other BCC.[28] To combat this potential bias, the authors split tumors by head/face and trunk/extremity. While subanalysis led to a small sample size of trunk/extremity tumors, the authors had an adequate number of head and face tumors to minimize selection bias by subanatomic location.

In summary, the authors demonstrate that low education level is associated with increased tumor size for patients with head and face NMSC. To their knowledge, this is the first study using tumor area and MMS defect area as a measure of morbidity. This study highlights the need to expand education campaigns on skin cancer prevention and diagnosis among lower socioeconomic sections. Additional

**TABLE 3. Correlation between age and Fitzpatrick scores with tumor area and Mohs defect area**

| | HEAD AND FACE | | TRUNK AND EXTREMITY | |
|---|---|---|---|---|
| | Tumor Area $mm^2$ | Mohs Defect Area $mm^2$ | Tumor Area $mm^2$ | Mohs Defect Area $mm^2$ |
| **Age** | R = -0.06 *P* = 0.42 | R = -0.07 *P*=0.40 | R = 0.26 *P* = 0.07 | R = 0.21 *P* = 0.13 |
| **Fitzpatrick scores** | R = 0.00 *P* = 0.94 | R = - 0.06 *P* = 0.50 | R = 0.04 *P* = 0.77 | R = 0.017 *P* = 0.91 |

risk factors (such as occupational exposure or pollutants) for larger tumors among these populations would be worth investigating.

**TABLE 4. Factors associated with performing self-skin exams**

| | % PERFORMING SSE | *P* |
|---|---|---|
| **Male** | 43% vs 38% | 0.56 |
| **Born in US** | 45% vs. 33% | 0.15 |
| **Hispanic** | 27% vs. 46% | **0.03** |
| **Need-based insurance** | 26% vs. 46% | 0.10 |
| **Systemic cancer Hx** | 50% vs. 39% | 0.29 |
| **Fitzpatrick type** | 47% Type I<br>41% Type II<br>40% Type III | 0.87 |
| **English vs. Spanish**<br>**Reading**<br>**Speaking**<br>**Thinking** | <br>45% vs. 21%<br>48% vs. 25%<br>45% vs. 26% | <br>**0.02**<br>**0.01**<br>**0.04** |
| **Physician exam 1 year** | 46% vs. 32% | 0.07 |
| **Physician exam 5 years** | 48% vs. 26% | **0.01** |
| **Formally learned SSE** | 78% vs. 29% | **<0.001** |
| **Relative W/ SC** | 50% vs. 36% | 0.08 |
| **Past Hx of SC** | 52% vs. 28% | **<0.01** |
| **Sunscreen < everyday** | 40% vs. 42% | 0.815 |
| **SPF 30 or lower** | 40% vs. 51% | 0.29 |
| **Heard of ABCDs** | 61% vs. 36% | **0.01** |
| **Right sided** | **54% vs 31%** | **0.01** |

**Hx=History, SC=Skin cancer, SPF=Sun protection factor, SSE=Self skin exam**

## REFERENCES


1. Kauvar AN, Cronin T Jr., Roenigk R, et al. Consensus for nonmelanoma skin cancer treatment: basal cell carcinoma, including a cost analysis of treatment methods. *Dermatol Surg.* 2015;41(5):550–571. .
2. Reeder VJ, Gustafson CJ, Mireku K, et al. Trends in Mohs surgery from 1995 to 2010: an analysis of nationally representative data. *Dermatol Surg.* 2015;41:397–403.
3. Connolly SM, Baker DR, Coldiron BM, et al. AAD/ACMS/ASDSA/ASMS 2012 appropriate use criteria for Mohs micrographic surgery: a report of the American Academy of Dermatology, American College of Mohs Surgery, American Society for Dermatologic Surgery Association, and the American Society for Mohs Surgery. *Dermatol Surg.* 2012;38:1582–1603.
4. Eide MJ, Weinstock MA, Dufresne RG, Jr., et al. Relationship of treatment delay with surgical defect size from keratinocyte carcinoma (basal cell carcinoma and squamous cell carcinoma of the skin). *J Invest Dermatol.* 2005;124:308–314.
5. Agbai ON, Buster K, Sanchez M, et al. Skin cancer and photoprotection in people of color: a review and recommendations for physicians and the public. *J Am Acad Dermatol.* 2014;70:748–762.
6. Javed S, Javed SA, Mays RM, Tyring SK. Clinical characteristics and awareness of skin cancer in Hispanic patients. *Dermatol Online J.* 2013;19:19623.
7. Wheat CM, Wesley NO, Jackson BA. Recognition of skin cancer and sun protective behaviors in skin of color. *J Drugs Dermatol.* 2013;12:1029–1032.
8. Coups EJ, Stapleton JL, Hudson SV, et al. Skin cancer surveillance behaviors among US Hispanic adults. *J Am Acad Dermatol.* 2013;68:576–584.
9. McLeod MP, Ferris KM, Choudhary S, et al. Contralateral distribution of nonmelanoma skin cancer between older Hispanic/Latino and non-Hispanic/non-Latino individuals. *Br J Dermatol.* 2013;168:65–73.
10. Steding-Jessen M, Birch-Johansen F, Jensen A, et al. Socioeconomic status and nonmelanoma skin cancer: a nationwide cohort study of incidence and survival in Denmark. *Cancer Epidemiol*. 2010;34:689–695.

11. Deady S, Sharp L, Comber H. Increasing skin cancer incidence in young, affluent, urban populations: a challenge for prevention. *Br J Dermatol.* 2014;171:324–331.
12. Doherty VR, Brewster DH, Jensen S, Gorman D. Trends in skin cancer incidence by socioeconomic position in Scotland, 1978-2004. *Br J Cancer.* 2010;102:1661–1664.
13. Amber KT, Ledon JA, Savas JA, et al. Visual identification of skin cancer in beachgoers: a need for improved education on non-melanoma skin cancer in the general population and melanoma in the African-American population. *Int J Dermatol.* 2015;54:e85–e87.
14. Robinson JK, Altman JS, Rademaker AW. Socioeconomic status and attitudes of 51 patients with giant basal and squamous cell carcinoma and paired controls. *Arch Dermatol.* 1995;131:428–431.
15. van Hattem S, Aarts MJ, Louwman WJ, et al. Increase in basal cell carcinoma incidence steepest in individuals with high socioeconomic status: results of a cancer registry study in The Netherlands. *Br J Dermatol.* 2009;161:840–845.
16. Buster KJ, You Z, Fouad M, Elmets C. Skin cancer risk perceptions: a comparison across ethnicity, age, education, gender, and income. *J Am Acad Dermatol*. 2012;66:771–779.
17. Jensen AO, Lamberg AL, Jacobsen JB, et al. Non-melanoma skin cancer and ten-year all-cause mortality: a population-based cohort study. *Acta Derm Venereol.* 2010;90:362–367.
18. Roman C, Lugo-Somolinos A, Thomas N. Skin cancer knowledge and skin self-examinations in the Hispanic population of North Carolina: the patient's perspective. *JAMA Dermatol.* 2013;149:103–104.
19. Korta DZ, Saggar V, Wu TP, Sanchez M. Racial differences in skin cancer awareness and surveillance practices at a public hospital dermatology clinic. *J Am Acad Dermatol.* 2014;70:312–317.
20. Risica PM, Weinstock MA, Rakowski W, et al. Body satisfaction effect on thorough skin self-examination. *Am J Prev Med.* 2008;35:68–72.
21. Pipitone M, Robinson JK, Camara C, et al. Skin cancer awareness in suburban employees: a Hispanic perspective. *J Am Acad Dermatol.* 2002;47:118–123.
22. Andreeva VA, Unger JB, Yaroch AL, et al. Acculturation and sun-safe behaviors among US Latinos: findings from the 2005 Health Information National Trends Survey. *Am J Public Health.* 2009;99:734–741.
23. Coups EJ, Stapleton JL, Hudson SV, et al. Sun protection and exposure behaviors among Hispanic adults in the United States: differences according to acculturation and among Hispanic subgroups. *BMC Public Health.* 2012;12:985.
24. Renzi C, Mastroeni S, Mannooranparampil TJ, et al. Skin cancer knowledge and preventive behaviors among patients with a recent history of cutaneous squamous cell carcinoma. *Dermatology*. 2008;217:74–80.
25. Yagerman S, Marghoob A. Melanoma patient self-detection: a review of efficacy of the skin self-examination and patient-directed educational efforts. *Expert Rev Anticancer Ther.* 2013;13:1423–1431.
26. Alam M, Goldberg LH, Silapunt S, et al. Delayed treatment and continued growth of nonmelanoma skin cancer. *J Am Acad Dermatol.* 2011;64:839–848.
27. Duffy KL, McKenna JK, Hadley ML, Tristani-Firouzi P. Nonmelanoma skin cancers of the ear: correlation between subanatomic location and post-Mohs micrographic surgery defect size. *Dermatol Surg.* 2009;35:30–33.
28. Carter KD, Nerad JA, Whitaker DC. Clinical factors influencing periocular surgical defects after Mohs micrographic surgery. *Ophthal Plast Reconstr Surg*. 1999;15:83–91.
29. Mulvaney PM, Higgins HW, 2nd, Dufresne RG, Jr., et al. Basal cell carcinomas of the ear are more aggressive than on other head and neck locations. *J Am Acad Dermatol.* 2014;70:924–926.